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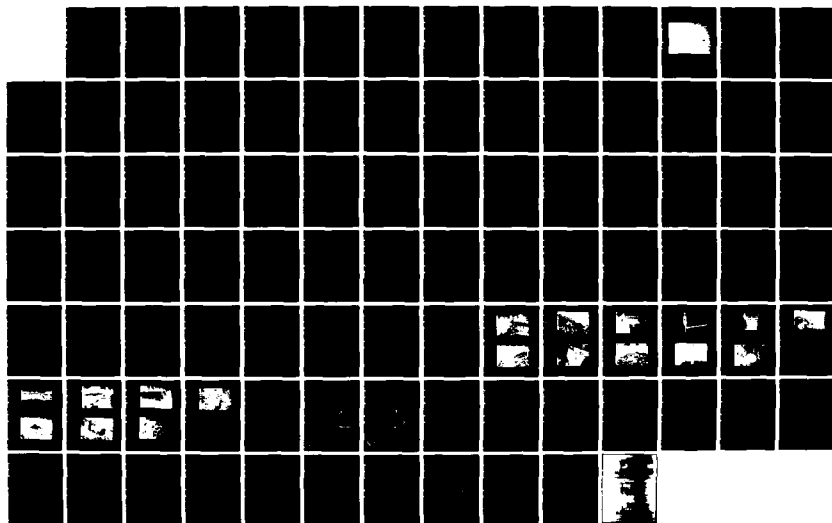
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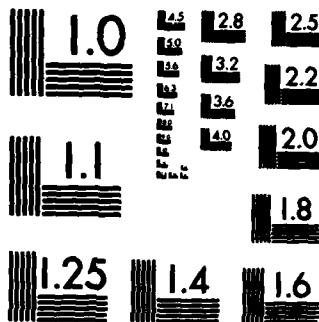
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THAMES RIVER BASIN
EASTFORD, CONNECTICUT

HALLS POND DAM

CT 00388

AND

CT 00598

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PHASE I INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

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| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number) | | |
| Halls Pond Dam includes two dams, with the northerly dam including the spillway and outlet works. The southerly dam consists of a dike only, with no outlet. The north dam is 250 feet long with the original dam being earth fill with masonry faces. This dam has a maximum height of 23.5 feet and a spillway consisting of twin 9' x 3.3' box culverts. The south dam is a 250 foot long earth dike with a maximum height of 14 feet. Halls Pond Dam is classified as SMALL in size with a hazard classification of LOW. The dam is in fair condition with some seepage at the south dam. | | |

NATIONAL DAM INSPECTION PROGRAM

PHASE I INSPECTION REPORT

| | |
|---------------------|----------------------|
| Identification No.: | CT 00388 CT 00598 |
| Name of Dam: | Halls Pond Dam |
| Town: | Eastford |
| County and State: | Windham, Connecticut |
| Stream: | Slovik Brook |
| Date of Inspection: | 27 February, 1981 |

BRIEF ASSESSMENT

Halls Pond includes two dams, with the northerly dam including the spillway and outlet works. The southerly dam consists of a dike only, with no outlet. Both dams were rebuilt in 1968. This is a State of Connecticut owned pond used for recreation.

The north dam is 250 feet long with the original dam being earth fill with masonry faces. In 1968, an impervious core and pervious shell were added to the downstream face. This dam has a maximum height of 23.5 feet and a spillway consisting of twin 9' x 3.3' box culverts.

The south dam is a 250 foot long earth dike with a maximum height of 14 feet. In 1968, an impervious core with pervious shell was added to the downstream face.

Halls Pond is classified as SMALL in size with a hazard classification of LOW. The dam is in fair condition with some seepage at the south dam.


Corps of Engineers Guidelines recommend a test flood of from 50 to 100 year frequency for dams of this size and hazard classification. A 100 year storm was used with a peak inflow of 560 cfs and a peak outflow of 243 cfs. The spillway will pass this flow with a water surface elevation of 516.7 without the outlet works operating and elevation 516.3 with the outlet gate full open.

It is recommended that an engineer study the seepage at the south dam and that the owner perform any corrective measures required. This should be done within one year, and the remedial measures detailed in Section 7 should be accomplished within one year.

FUSS & O'NEILL, INC.

By: Walter S. Fuss
Walter S. Fuss, P.E.
President

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PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the

dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

The Phase I Investigation does not include an assessment of the need for fences, gates, no-trespassing signs, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety to the public. An evaluation of the project for compliance with OSHA rules and regulations is also excluded.

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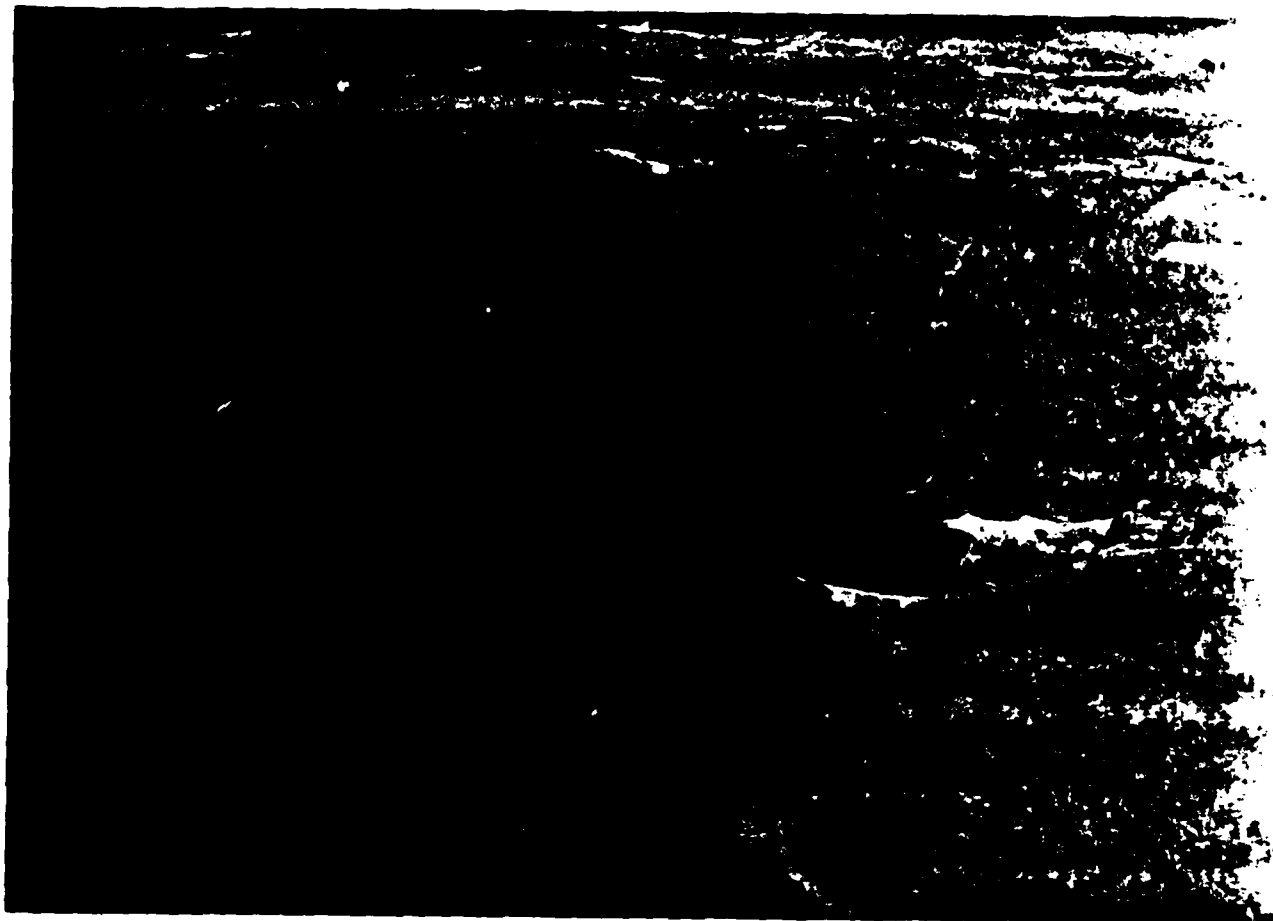
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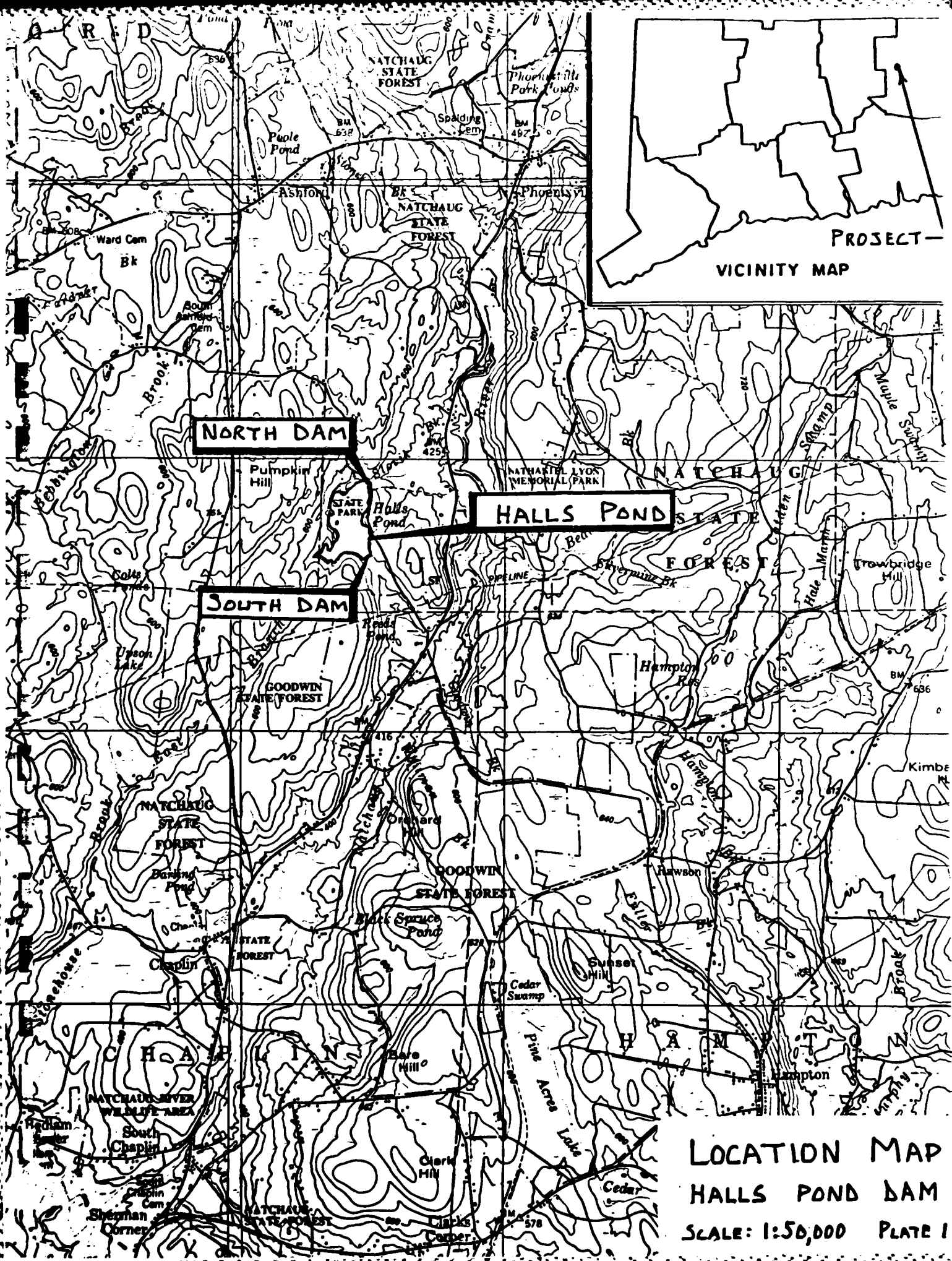
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APPENDICES

| <u>Appendix</u> | <u>Description</u> |
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| A | INSPECTION CHECKLIST |
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OVERVIEW PHOTO



NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT
HALLS POND DAM CT 00388 AND 00598

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL:

a. Authority. Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a national program of dam inspection through the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Fuss & O'Neill, Inc. has been retained by the New England Division to inspect and report on selected dams in the State of Connecticut. Authorization and notice to proceed was issued to Fuss & O'Neill, Inc. under a letter of 25 November, 1980 from William E. Hodgson, Jr., Colonel, Corps of Engineers. Contract No. DACW33-81-C-0020 has been assigned by the Corps of Engineers for this work.

b. Purpose.

1. Perform technical inspection and evaluation of non-federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-federal interests.
2. Encourage and assist the States to initiate quickly effective dam safety programs for non-federal dams.
3. To update, verify and complete the National Inventory of Dams.

1.2 DESCRIPTION

- a. Location. Halls Pond Dam is located in the Town of Eastford, County of Windham, on the west side of Kennerson Reservoir Road about 0.9 miles northwest of Connecticut Route 198. The north dam is at latitude 41°-50.6' and longitude 72°-6.4' and the south dam is at latitude 41°-50.2' and longitude 72°-6.5'. Slovik Brook starts at Halls Pond Dam and joins the Natchaug River about 0.8 miles to the east. Natchaug River joins other streams about 11.5 miles downstream in Willimantic to form the Shetucket River. The watershed is rolling and contains 1.3 miles of mostly wooded area.
- b. Description of Dam and Appurtenances. There are two dams impounding Halls Pond. The north dam is the main structure and includes outlet works with a gate house and 24 inch outlet pipe as well as a spillway consisting of twin 9 foot by 3.3 foot concrete box culverts. Kennerson Reservoir Road forms the crest of the dam. The north dam is shown in Photos C1-1 through C1-11. An original earth filled masonry faced dam was partially reconstructed in 1968 by adding an impervious core and pervious shell on the downstream slope. This dam has a length of 250 feet.

The south dam is 250 feet long and consists of an original earth dike with an impervious core and pervious shell added in 1968. There is no outlet at this dam which acts as a dike. The

crest consists of a 10 foot wide gravel roadway. Photos C2-1 through C2-7 show the south dam.

- c. Size Classification. The north dam has a height of 23.5 feet and the south dam has a height of 14 feet. At top of dam level, the total storage volume is 890 acre-feet. The dam is therefore classified as a SMALL structure in accordance with the recommended guidelines of the Corps of Engineers which defines a small dam as one with a storage capacity of 50 to 1,000 acre-feet and a height of 25 or more but less than 40 feet.
- d. Hazard Classification. This dam is classified as having a LOW hazard potential because no structures would be damaged and only the roadway forming the crest of the north dam would be damaged.
- e. Ownership. Halls Pond Dams are owned by the State of Connecticut and are maintained by the Department of Environmental Protection.
- f. Operator. Operating personnel are under the direction of:

Region Director
Department of Environmental Protection
- g. Purpose of Dam. Halls Pond is a recreational lake used mainly for fishing.

- h. Design and Construction History. The design and construction details for the original dam are unknown. Major repairs and reconstruction of both dams were undertaken in 1968. Impervious cores with pervious shells were added to the downstream faces of both dams and a new spillway and outlet works were constructed at the north dam. The construction plans were reviewed, but design calculations were not studied.
- i. Normal Operating Procedures. No operating records are available. The outlet works normally remain closed.

1.3 PERTINENT DATA

- a. Drainage Area. Halls Pond is located in northeast Connecticut and the watershed is rural and rolling in nature with only a few scattered homes. There are no significant storage areas to dampen the flows from the 1.3 square mile area.
- b. Discharge at Dam Site. There is no history of discharge data available for this dam. The following discharge data have been calculated with the calculations included in Appendix D.

1. Outlet Works
24" Concrete pipe, Invert
Elev. 504.0
- | | | |
|----------------------|-------|--------|
| Top of dam elevation | 518.0 | 40 cfs |
| Test flood elevation | 516.3 | 40 cfs |
2. Maximum known flood
- Unknown

| | | |
|----|---|---------|
| 3. | Ungated spillway capacity Top of dam elevation 518.0 | 430 cfs |
| 4. | Ungated spillway capacity Test flood elevation 516.3 | 200 cfs |
| 5. | Gated spillway capacity Normal pool elevation | N/A |
| 6. | Gated spillway capacity Test flood elevation 516.3 | N/A |
| 7. | Total spillway capacity Test flood elevation 516.3 | 200 cfs |
| 8. | Total project discharge Top of dam elevation 518.0 | 470 cfs |
| 9. | Total project discharge Test flood elevation 516.3 | 240 cfs |

c. Elevation. (feet above NGVD)

NORTH DAM

| | | |
|----|-------------------------|---------|
| 1. | Streambed at toe of dam | 501.0 |
| 2. | Bottom of cutoff | None |
| 3. | Maximum tailwater | Unknown |
| 4. | Normal pool | 514.0 |
| 5. | Full flood control pool | N/A |
| 6. | Spillway crest | 514.0 |
| 7. | Design surcharge | 517.0 |
| 8. | Top of dam | 518.0 |
| 9. | Test flood surcharge | 516.3 |

SOUTH DAM

| | |
|----------------------------|-------|
| 1. Streambed at toe of dam | 503.5 |
| 2. Bottom of cutoff | None |
| 3. Maximum tailwater | N/A |
| 4. Normal pool | 514.0 |
| 5. Full flood control pool | N/A |
| 6. Spillway crest | None |
| 7. Design surcharge | 517.0 |
| 8. Top of dam | 517.5 |
| 9. Test flood surcharge | 516.3 |

d. Reservoir. (Length in feet)

| | |
|------------------------|-------|
| 1. Normal pool | 3,500 |
| 2. Flood control pool | N/A |
| 3. Spillway crest pool | 3,500 |
| 4. Top of dam | 3,500 |
| 5. Test flood pool | 3,500 |

e. Storage. (Acre-Feet)

| | |
|------------------------|-----|
| 1. Normal pool | 550 |
| 2. Flood control pool | N/A |
| 3. Spillway crest pool | 550 |
| 4. Top of dam | 890 |
| 5. Test flood pool | 750 |

f. Reservoir Surface. (Acres)

| | |
|-----------------------|-----|
| 1. Normal pool | 82 |
| 2. Flood control pool | N/A |
| 3. Spillway crest | 82 |
| 4. Test flood pool | 84 |
| 5. Top of dam | 85 |

g. Dam.

NORTH DAM

| | | |
|--------------------|---------|--|
| 1. Type | | |
| Original dam | | Earth fill with masonry faces |
| Added | | Downstream impervious core and pervious shell |
| 2. Length | 250' | |
| 3. Height | 23.5' | |
| 4. Top width | 30' | |
| 5. Side slope | 2H:1V | |
| 6. Zoning | | Impervious core added but does not meet requirements of Bureau of Reclamation for width to be considered a zoned structure |
| 7. Impervious core | | Top width varies 5' to 8' with slopes 1H:2V |
| 8. Cutoff | Unknown | |
| 9. Grout curtains | Unknown | |

SOUTH DAM

| | |
|---|--|
| 1. Type | Earth dike |
| Original | |
| Added | Downstream impervious core and pervious shell |
| 2. Length | 250' |
| 3. Height | 14' |
| 4. Top width | 14' |
| 5. Side slopes | 2H:1V |
| 6. Zoning | Impervious core added but does not meet requirements of Bureau of Reclamation for width to be considered a zoned structure |
| 7. Impervious core | Top width 4', U.S. slope negative 1H:2V and D.S. slope 1H:1V |
| 8. Cutoff | Unknown |
| 9. Grout curtains | Unknown |
| h. <u>Diversion of Regulating Tunnel.</u> | N/A |
| i. <u>Spillway.</u> | |
| 1. Type | Twin 9'x3.3' concrete box culvert |
| 2. Length of weir | 18' |
| 3. Crest elevation | 514.0 |
| 4. Gates | None |
| 5. U/S Channel | Natural Bed |
| 6. D/S Channel | Concrete chute |

j. Regulating Outlets.

| | |
|----------------------|-------------------------------|
| 1. Invert | 504.0 |
| 2. Size | 24" |
| 3. Description | Concrete pipe |
| 4. Control mechanism | Metal slide gate |
| 5. Other | Contained in brick gate house |

SECTION 2 - ENGINEERING DATA

2.1 DESIGN

Design data for the original dam is not available. Design data for the 1968 construction was not reviewed.

2.2 CONSTRUCTION

No record of the original construction is available

2.3 OPERATION

No operating records are available.

2.4 EVALUATION

- a. Availability. Construction plans for the 1968 construction were supplied. Original design data and construction plans are not available.
- b. Adequacy. A definitive review was not made.
- c. Validity. The validity of available data should be verified if a definitive review is to be performed.

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

a. General. Based on visual inspection, the two Halls Pond Dams appear to be in fair condition.

b. Dams.

NORTH DAM

1. Upstream Face - The dumped rock fill is missing in some areas. There is minor brush growth, most of which has been trimmed as shown in Photos C1-1 and C1-6. There has been some erosion just south of the spillway, caused by storm runoff from the roadway.
2. Crest - The crest consists of Kennerson Reservoir Road which is an oiled gravel Town road. The road is in good condition, but the wire rope guide rail on the west side has been partially removed at the south end as shown in Photo C1-1.
3. Downstream Face - The downstream face is grass covered with some brush growth as shown in Photos C1-2 and C1-3. No seepage was observed.

SOUTH DAM

1. Upstream Face - The upstream face has dumped rock fill which is missing in some areas as shown in Photos C2-3 and C2-4. There is minor erosion from wave action.

2. Crest - The crest is a gravel road in good condition as shown in Photo C2-2.

3. Downstream Face - The downstream face is grass covered with some brush growth as shown in Photo C2-5. There is some seepage at the west end as shown in Photo C2-6. The seepage cannot be quantified without further investigation.

c. Appurtenant Structures.

1. Spillway - Twin 9'x3.3' cast-in-place concrete box culverts constructed in 1968 form the spillway with a concrete channel on a 2H:1V slope for an outlet channel. Photos C1-4 and C1-5 show the spillway and channel. The spillway is in good condition except for a crack at the wingwall at the northwest corner as shown in Photo C1-4. This crack should be investigated further.

2. Outlet Works - The outlet works consist of a 24 inch concrete pipe starting at the base of the upstream slope and running to a gate house just west of the road. A metal slide gate controls the flow and a 24 inch concrete outlet pipe discharges at the toe of slope at a concrete endwall. Photos C1-6, C1-7, C1-8, C1-9 and C1-10 show the outlet works are in good condition except that the gate house door hardware is badly rusted and the lock is inoperable. Since there is no lock on the control wheel, the operation of the outlet works

is susceptible to vandalism and unauthorized drawdown of the reservoir.

d. Reservoir Area.

No detrimental features in the reservoir area were observed during the visual inspection.

e. Downstream Channel.

At the north dam, the downstream channel is a natural stream called Slovik Brook as shown in Photo C1-11. At the south dam, an unnamed stream forms in a swampy area at the base of the dam as shown in Photo C2-7.

3.2 EVALUATION

Based on the visual inspection, the overall condition of Halls Pond Dams is fair with areas that require attention as outlined in Section 7.

SECTION 4 - OPERATIONAL AND MAINTENANCE PROCEDURES

4.1 OPERATIONAL PROCEDURES

- a. General. This is a recreational pond that remains full during normal conditions. There is no other use of the water.
- b. Description of Any Warning System in Effect. There is no formal downstream warning system in case of emergency at the dam.

4.2 MAINTENANCE PROCEDURES

- a. General. This dam is checked for maintenance requirements two times per year by District maintenance personnel and any required work is done at that time. Maintenance appears to be limited mainly to removal and trimming of vegetation.
- b. Operating Facilities. There does not appear to be any particular maintenance performed on the operating facilities.

4.3 EVALUATION

The existing maintenance schedule should be continued and expanded to include the outlet facilities and rock dam faces.

SECTION 5 - EVALUATION OF HYDRAULIC/HYDROLOGIC FEATURES

5.1 GENERAL The north dam at Halls Pond is 250 feet long with a maximum height of 23.5 feet. There is a spillway consisting of twin 9'x3.3' box culverts and a 24" concrete pipe outlet.

The 1.3 square mile watershed is rolling and mainly wooded as shown in the overview photo. There are no significant storage areas in the watershed.

5.2 DESIGN DATA

When the 1968 construction was under design, the engineer determined that the time of concentration for Halls Pond is 85 minutes and the runoff coefficient is 0.34.

5.3 EXPERIENCE DATA

No historical data for recorded discharges or water surface elevations is available for this dam or the watershed.

5.4 TEST FLOOD ANALYSIS Recommended guidelines for the safety inspection of dams by the Corps of Engineers were used for the selection of the "Test Flood". Halls Pond is classified as small in size with a low hazard potential. Guidelines for these classifications recommend an event equal in magnitude to a storm of 50 year to 100 year return frequency. A 100 year storm was chosen for the test flood. The rational method was used with data developed when the 1968 reconstruction was designed.

The test flood was calculated to be 560 cfs with a peak outflow of 240 cfs. This outflow results in a water surface elevation of 516.3 which is 1.7 feet below top of dam. The capacity of the spillway at top of dam elevation is 430 cfs.

5.5 DAM FAILURE ANALYSIS At the north dam, applying the calculated dam failure discharge of 14,200 cfs when the water surface elevation is 518 (top of dam) will produce an approximate water surface elevation of 505.6 just downstream of the dam. Depths of flow would range from 11.1 feet just below the dam to 16.2 feet 2,500 feet downstream of the dam to 8.6 feet where Slovik Brook joins the Natchaug River 3,700 feet downstream. The only damage that would be done is to the roadway on the crest of dam. No buildings would be affected.

At the south dam, applying the calculated dam failure discharge of 9,200 cfs with the pond at top dam elevation will produce an approximate water surface elevation of 514.7 just below the dam. Depths of flow would range from 11.2 feet just below the dam to 4.0 feet 2,500 feet downstream of the dam. No houses, other structures or roads would be damaged.

Halls Pond Dams are classified as having a low hazard because no structures would be damaged. Computations of water surface elevations and a map showing the limits of the impact area are included in Appendix D.

SECTION 6 - STRUCTURAL STABILITY

6.1 VISUAL OBSERVATION The field inspection did not reveal any stability problems.

6.2 DESIGN AND CONSTRUCTION DATA There is no design or construction information available for the original dam construction to permit a formal evaluation of the stability of the dam. Thus, the evaluation of stability is based solely on the visual inspection and the construction plans for the 1968 work.

6.3 POST CONSTRUCTION CHANGES There are no post construction changes apparent except for the 1968 construction.

6.4 SEISMIC STABILITY Halls Pond Dams are located in Seismic Zone 1 and in accordance with Corps of Engineers guidelines do not warrant further seismic analysis at this time.

SECTION 7 - ASSESSMENT, RECOMMENDATIONS AND REMEDIAL MEASURES

7.1 DAM ASSESSMENT

- a. Condition. Based on the visual inspection, Halls Pond Dams appears to be in fair condition.
- b. Adequacy of Information. The lack of in-depth engineering data did not allow for a definitive review. Therefore, the adequacy of these dams could not be assessed from the standpoint of reviewing design and construction data, but is based primarily on the visual inspection, plans for 1968 construction, past operational performance of the structure, and sound engineering judgement.
- c. Urgency. The recommendations presented in Section 7.2 should be carried out within one year of receipt of this report by the Owner and the remedial measures presented in Section 7.3 within two years.

7.2 RECOMMENDATIONS

It is recommended that the Owner employ a qualified registered engineer to:

- a. Investigate areas of seepage in the downstream face of the south dam to determine if repairs are warranted.
- b. Investigate the crack in the box culvert spillway at the northwest corner to determine if repairs are warranted.

7.3 REMEDIAL MEASURES

a. Operation and Maintenance Procedures.

1. Repair guide rail at south end of north dam.
2. Construct paved ditch to carry road water at spillway.
3. Paint all steel in gate house and repair lock on door.
4. Repair riprap at both dams.
5. Check operation of gate on a regular basis.

7.4 ALTERNATIVES

There are no practical alternatives to the recommendations and remedial measures in Sections 7.2 and 7.3.

APPENDIX A

INSPECTION CHECK LIST

VISUAL INSPECTION CHECK LIST
PARTY ORGANIZATION

PROJECT Halls Pond DATE 2/27/81
North Dam

TIME 11:00 a.m.

WEATHER Clear - 45°

W.S.Elev. 514.0 U.S. 495.0 DN.S.

PARTY:

- | | |
|--|-----------|
| 1. <u>G. Mirtl, Hydrology & Hydraulics</u> | 6. _____ |
| 2. <u>E. Lang, Structural & Mechanical</u> | 7. _____ |
| 3. <u>S. Marniki, Soils & Geology</u> | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

| <u>PROJECT FEATURE</u> | <u>INSPECTED BY</u> | <u>REMARKS</u> |
|------------------------|---------------------|----------------|
| 1. _____ | | |
| 2. _____ | | |
| 3. _____ | | |
| 4. _____ | | |
| 5. _____ | | |
| 6. _____ | | |
| 7. _____ | | |
| 8. _____ | | |
| 9. _____ | | |
| 10. _____ | | |

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - North DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

| AREA EVALUATED | CONDITION |
|--|---|
| <u>DIKE EMBANKMENT</u> | |
| Crest Elevation | 518.0 |
| Current Pool Elevation | 514.0 |
| Maximum Impoundment to Date | Unknown |
| Surface Cracks | None |
| Pavement Condition | Good |
| Movement or Settlement of Crest | None |
| Lateral Movement | None |
| Vertical Alignment | Good |
| Horizontal Alignment | Good |
| Condition at Abutment and at Concrete Structures | Some erosion S.W. side of inlet wingwall |
| Indications of Movement of Structural Items on Slopes | None |

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - North DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

| AREA EVALUATED | CONDITION |
|--|--|
| <u>DIKE EMBANKMENT (cont)</u> | |
| Trespassing on Slopes | Fisherman use U.S. slope |
| Sloughing or Erosion of Slopes or Abutments | Minor from wave action and road runoff |
| Rock Slope Protection - Riprap Failures | Some stone missing |
| Unusual Movement or Cracking at or near Toes | None |
| Unusual Embankment or Downstream Seepage | None |
| Piping or Boils | None |
| Foundation Drainage Features | None |
| Toe Drains | None |
| Instrumentation System | None |
| Vegetation | Some small trees D.S. slope |
| A-3 | |

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - North DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

| AREA EVALUATED | CONDITION |
|---|------------------|
| <u>OUTLET WORKS - INTAKE CHANNEL</u> <u>AND INTAKE STRUCTURE</u> | |
| a. Approach Channel | Pipe under water |
| Slope Conditions | |
| Bottom Conditions | |
| Rock Slides or Falls | |
| Log Boom | |
| Debris | |
| Condition of Concrete Lining | |
| Drains or Weep Holes | |
| b. Intake Structure | |
| Condition of Concrete | Good |
| Stop Logs and Slots | Good |

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - North DATE 2/27/81
 PROJECT FEATURE _____ NAME _____
 DISCIPLINE _____ NAME _____

| AREA EVALUATED | CONDITION |
|--|-----------|
| <u>OUTLET WORKS - TRANSITION AND CONDUIT</u> | Pipe |
| General Condition of Concrete | Good |
| Rust or Staining on Concrete | None |
| Spalling | None |
| Erosion or Cavitation | None |
| Cracking | None |
| Alignment of Monoliths | N/A |
| Alignment of Joints | N/A |
| Numbering of Monoliths | N/A |

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - North DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

| AREA EVALUATED | CONDITION |
|--|-----------------------|
| <u>OUTLET WORKS - CONTROL TOWER</u> | |
| a. Concrete and Structural | |
| General Condition | Good |
| Condition of Joints | Good |
| Spalling | None |
| Visible Reinforcing | None |
| Rusting or Staining of Concrete | None |
| Any Seepage or Efflorescence | None |
| Joint Alignment | Good |
| Unusual Seepage or Leaks in Gate Chamber | None observed |
| Cracks | None observed |
| Rusting or Corrosion of Steel | Door hardware rusting |
| A-6 | |

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - North DATE 2/27/81
 PROJECT FEATURE _____ NAME _____
 DISCIPLINE _____ NAME _____

| AREA EVALUATED | CONDITION |
|---|--|
| <u>OUTLET WORKS - CONTROL TOWER</u> (cont) | |
| b. Mechanical and Electrical | No electrical |
| Air Vents | Good |
| Float Wells | N/A |
| Crane Hoist | N/A |
| Elevator | N/A |
| Hydraulic System | N/A |
| Service Gates | Some rusting of control wheel not secured from unauthorized use. |
| Emergency Gates | N/A |
| Lightning Protection System | N/A |
| Emergency Power System | N/A |
| Wiring and Lighting System | N/A |
| A-7 | |

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - North DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

| AREA EVALUATED | CONDITION |
|---|-----------|
| <u>OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL</u> | Pipe |
| General Condition of Concrete | Good |
| Rust or Staining | None |
| Spalling | None |
| Erosion or Cavitation | None |
| Visible Reinforcing | None |
| Any Seepage or Efflorescence | None |
| Condition at Joints | Good |
| Drain Holes | None |
| Channel | Good |
| Loose Rock or Trees Overhanging Channel | None |
| Condition of Discharge Channel | Good |

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - North DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

| AREA EVALUATED | CONDITION |
|--|-----------|
| <u>OUTLET WORKS - SPILLWAY WEIR,</u> <u>APPROACH AND DISCHARGE</u> <u>CHANNELS</u> | |
| a. Approach Channel | |
| General Condition | Good |
| Loose Rock Overhanging Channel | N/A |
| Trees Overhanging Channel | None |
| Floor of Approach Channel | Good |
| b. Weir and Training Walls | |
| General Condition of Concrete | Good |
| Rust of Staining | None |
| Spalling | None |
| Any Visible Reinforcing | None |
| Any Seepage or Efflorescence | None |

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - North DATE 2/27/81
 PROJECT FEATURE _____ NAME _____
 DISCIPLINE _____ NAME _____

| AREA EVALUATED | CONDITION |
|--|--------------------------------|
| <u>OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS</u> | |
| b. Weir and Training Walls | |
| Drain Holes | None |
| c. Discharge Channel | |
| General Condition | Good |
| Loose Rock Overhanging Channel | None |
| Trees Overhanging Channel | None |
| Floor of Channel | Good |
| Other Obstructions | Some debris at end of channel. |

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - North DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

| AREA EVALUATED | CONDITION |
|--------------------------------------|-----------|
| <u>OUTLET WORKS - SERVICE BRIDGE</u> | N/A |
| a. Super Structure | |
| Bearings | |
| Anchor Bolts | |
| Bridge Seat | |
| Longitudinal Members | |
| Under Side of Deck | |
| Secondary Bracing | |
| Deck | |
| Drainage System | |
| Railings | |
| Expansion Joints | |
| Paint | |
| A-11 | |

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - North

DATE 2/27/81

PROJECT FEATURE

NAME _____

DISCIPLINE

NAME

| AREA EVALUATED | CONDITION |
|--|-----------|
| <u>OUTLET WORKS - SERVICE BRIDGE</u> (cont) | N/A |
| b. Abutment & Piers | |
| General Condition of Concrete | |
| Alignment of Abutment | |
| Approach to Bridge | |
| Condition of Seat & Backwall | |

VISUAL INSPECTION CHECK LIST
PARTY ORGANIZATION

PROJECT Halls Pond - South Dam DATE 2/27/81

TIME 10:00 a.m.

WEATHER Clear - windy - 40°

W.S.Elev. 514.0 U.S. None DN.S.

PARTY:

- | | |
|--|-----------|
| 1. <u>G. Mirtl, Hydrology & Hydraulics</u> | 6. _____ |
| 2. <u>E. Lang, Structural & Mechanical</u> | 7. _____ |
| 3. <u>S. Marniki, Soils & Geology</u> | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

| <u>PROJECT FEATURE</u> | <u>INSPECTED BY</u> | <u>REMARKS</u> |
|------------------------|---------------------|----------------|
| 1. _____ | | |
| 2. _____ | | |
| 3. _____ | | |
| 4. _____ | | |
| 5. _____ | | |
| 6. _____ | | |
| 7. _____ | | |
| 8. _____ | | |
| 9. _____ | | |
| 10. _____ | | |

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - South DATE 2/27/81
 PROJECT FEATURE _____ NAME _____
 DISCIPLINE _____ NAME _____

| AREA EVALUATED | CONDITION |
|--|-----------|
| <u>DIKE EMBANKMENT</u> | |
| Crest Elevation | 517.5 |
| Current Pool Elevation | 514.0 |
| Maximum Impoundment to Date | Unknown |
| Surface Cracks | None |
| Pavement Condition | Good |
| Movement or Settlement of Crest | None |
| Lateral Movement | None |
| Vertical Alignment | Good |
| Horizontal Alignment | Good |
| Condition at Abutment and at Concrete Structures | N/A |
| Indications of Movement of Structural Items on Slopes | N/A |

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - South DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

| AREA EVALUATED | CONDITION |
|--|---|
| <u>DIKE EMBANKMENT (cont)</u> | |
| Trespassing on Slopes | Fisherman on U.S. slope |
| Sloughing or Erosion of Slopes or Abutments | Some erosion U.S. from wave action |
| Rock Slope Protection - Riprap Failures | Some riprap missing above normal water level U.S. |
| Unusual Movement or Cracking at or near Toes | None |
| Unusual Embankment or Downstream Seepage | Some seepage west end at base of slope |
| Piping or Boils | None |
| Foundation Drainage Features | Toe Drain |
| Toe Drains | Appear to be operating |
| Instrumentation System | None |
| Vegetation | Small brush both sides |
| A-15 | |

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - South DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

| AREA EVALUATED | CONDITION |
|---|-----------|
| <u>OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE</u> | N/A |
| a. Approach Channel | |
| Slope Conditions | |
| Bottom Conditions | |
| Rock Slides or Falls | |
| Log Boom | |
| Debris | |
| Condition of Concrete Lining | |
| Drains or Weep Holes | |
| b. Intake Structure | |
| Condition of Concrete | |
| Stop Logs and Slots | |
| A-16 | |

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - South DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

| AREA EVALUATED | CONDITION |
|--|-----------|
| <u>OUTLET WORKS - TRANSITION AND CONDUIT</u> | N/A |
| General Condition of Concrete | |
| Rust or Staining on Concrete | |
| Spalling | |
| Erosion or Cavitation | |
| Cracking | |
| Alignment of Monoliths | |
| Alignment of Joints | |
| Numbering of Monoliths | |
| A-17 | |

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - South DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

| AREA EVALUATED | CONDITION |
|--|-----------|
| <u>OUTLET WORKS - CONTROL TOWER</u> | N/A |
| a. Concrete and Structural | |
| General Condition | |
| Condition of Joints | |
| Spalling | |
| Visible Reinforcing | |
| Rusting or Staining of Concrete | |
| Any Seepage or Efflorescence | |
| Joint Alignment | |
| Unusual Seepage or Leaks in Gate Chamber | |
| Cracks | |
| Rusting or Corrosion of Steel | |
| A-18 | |

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - South DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

| AREA EVALUATED | CONDITION |
|---|-----------|
| <u>OUTLET WORKS - CONTROL TOWER</u> (cont) | N/A |
| b. Mechanical and Electrical | |
| Air Vents | |
| Float Wells | |
| Crane Hoist | |
| Elevator | |
| Hydraulic System | |
| Service Gates | |
| Emergency Gates | |
| Lightning Protection System | |
| Emergency Power System | |
| Wiring and Lighting System | |
| A-19 | |

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - South DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

| AREA EVALUATED | CONDITION |
|---|-----------|
| <u>OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL</u> | N/A |
| General Condition of Concrete | |
| Rust or Staining | |
| Spalling | |
| Erosion or Cavitation | |
| Visible Reinforcing | |
| Any Seepage or Efflorescence | |
| Condition at Joints | |
| Drain Holes | |
| Channel | |
| Loose Rock or Trees Overhanging Channel | |
| Condition of Discharge Channel | |
| A-20 | |

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - South DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

| AREA EVALUATED | CONDITION |
|--|-----------|
| <u>OUTLET WORKS - SPILLWAY WEIR,</u> <u>APPROACH AND DISCHARGE</u> <u>CHANNELS</u> | N/A |
| a. Approach Channel | |
| General Condition | |
| Loose Rock Overhanging Channel | |
| Trees Overhanging Channel | |
| Floor of Approach Channel | |
| b. Weir and Training Walls | |
| General Condition of Concrete | |
| Rust or Staining | |
| Spalling | |
| Any Visible Reinforcing | |
| Any Seepage or Efflorescence | |

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - South DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

| AREA EVALUATED | CONDITION |
|--|-----------|
| <u>OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS</u> | N/A |
| b. Weir and Training Walls | |
| Drain Holes | |
| c. Discharge Channel | |
| General Condition | |
| Loose Rock Overhanging Channel | |
| Trees Overhanging Channel | |
| Floor of Channel | |
| Other Obstructions | |

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - South DATE 2/27/81
 PROJECT FEATURE _____ NAME _____
 DISCIPLINE _____ NAME _____

| AREA EVALUATED | CONDITION |
|--------------------------------------|-----------|
| <u>OUTLET WORKS - SERVICE BRIDGE</u> | N/A |
| a. Super Structure | |
| Bearings | |
| Anchor Bolts | |
| Bridge Seat | |
| Longitudinal Members | |
| Under Side of Deck | |
| Secondary Bracing | |
| Deck | |
| Drainage System | |
| Railings | |
| Expansion Joints | |
| Paint | |

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - South DATE 2/27/81

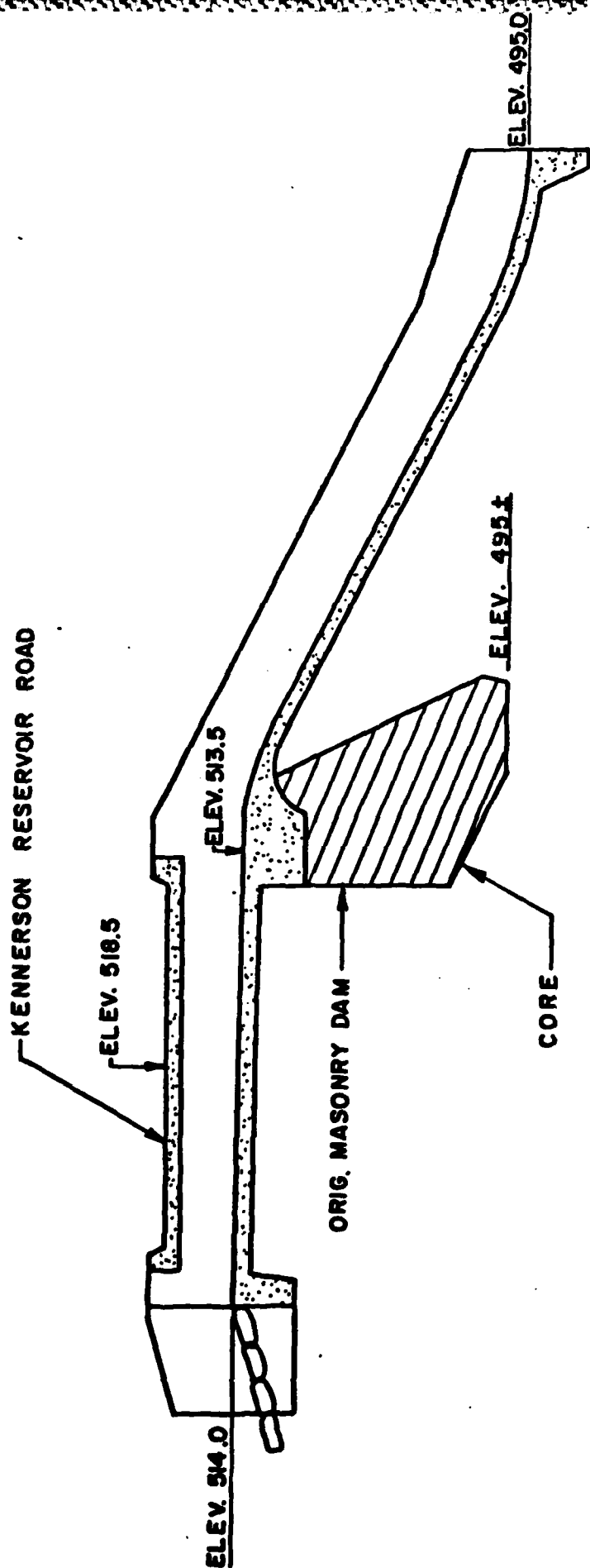
PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

| AREA EVALUATED | CONDITION |
|--|-----------|
| <u>OUTLET WORKS - SERVICE BRIDGE</u> (cont) | N/A |
| b. Abutment & Piers | |
| General Condition of Concrete | |
| Alignment of Abutment | |
| Approach to Bridge | |
| Condition of Seat & Backwall | |
| A-24 | |

APPENDIX B

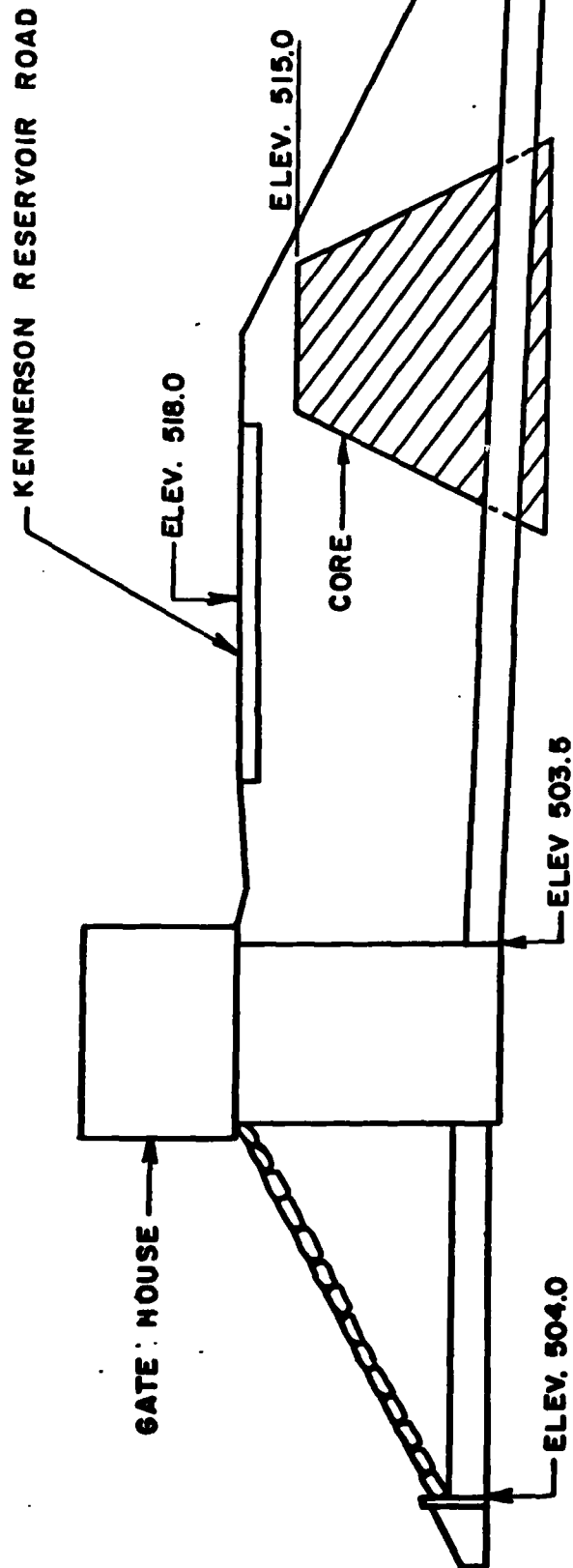
ENGINEERING DATA



HALLS POND
NORTH DAM

SECTION AT SPILLWAY

SCALE: 1" = 10'



HALLS POND
SECTION AT OUTLET WORKS
SCALE: 1" = 10'



HALLS POND
WATER LEVEL 514.0

GRAVEL ROAD

TOE DRAIN

TOE OF SLOPE

HALLS POND
SOUTH DAM

PLAN

SCALE: 1" = 40'

No. _____

WATER RESOURCES UNIT
SUPERVISION OF DAMS
INVENTORY DATA

Inventoried
By _____

Date _____

14-1511
north dam: lat: $41^{\circ}50.6'$
Long: $72^{\circ}6.4'$
south dam: lat: $41^{\circ}50.2'$
Long: $72^{\circ}6.5'$

Name of Dam or Pond HALLS POND (North Dam - (2) dams)

Code No. _____

Nearest Street Location _____

Town Eastford

U.S.G.S. Quad. Hampton

Name of Stream Slovik Branch

Owner State of Connecticut

Address DEP

rebuilt 1968

South Chaplin

Pond Used For _____ Drainage Area 1.23 sq.mi.

Dimensions of Pond: Width _____ Length _____ Area 82.3

Total Length of Dam n=400'
s=450' Length of Spillway 19'

Location of Spillway _____

Height of Pond Above Stream Bed 16' north none=south

Height of Embankment Above Spillway 5' north

Type of Spillway Construction concrete (north)

Type of Dike Construction earth (s) earth cover with riprap (n)

Downstream Conditions woods, pond, road south

woods, farm, road north

Summary of File Data F & G asked to repair leak Feb. 63; modifications

under design March 62

Remarks 10/20/78 This dam appeared in good condition. The north dam is in
good condition and is riprapped on the upstream face. Kennersen Road serves as
the north dam and is in good condition. The concrete spillway is also in good
condition. PB

Would Failure Cause Damage? YES Class C

APPENDIX C

PHOTOGRAPHS

HALLS POND
WATER LEVEL 514.0

GRAVEL ROAD

TOE DRAIN

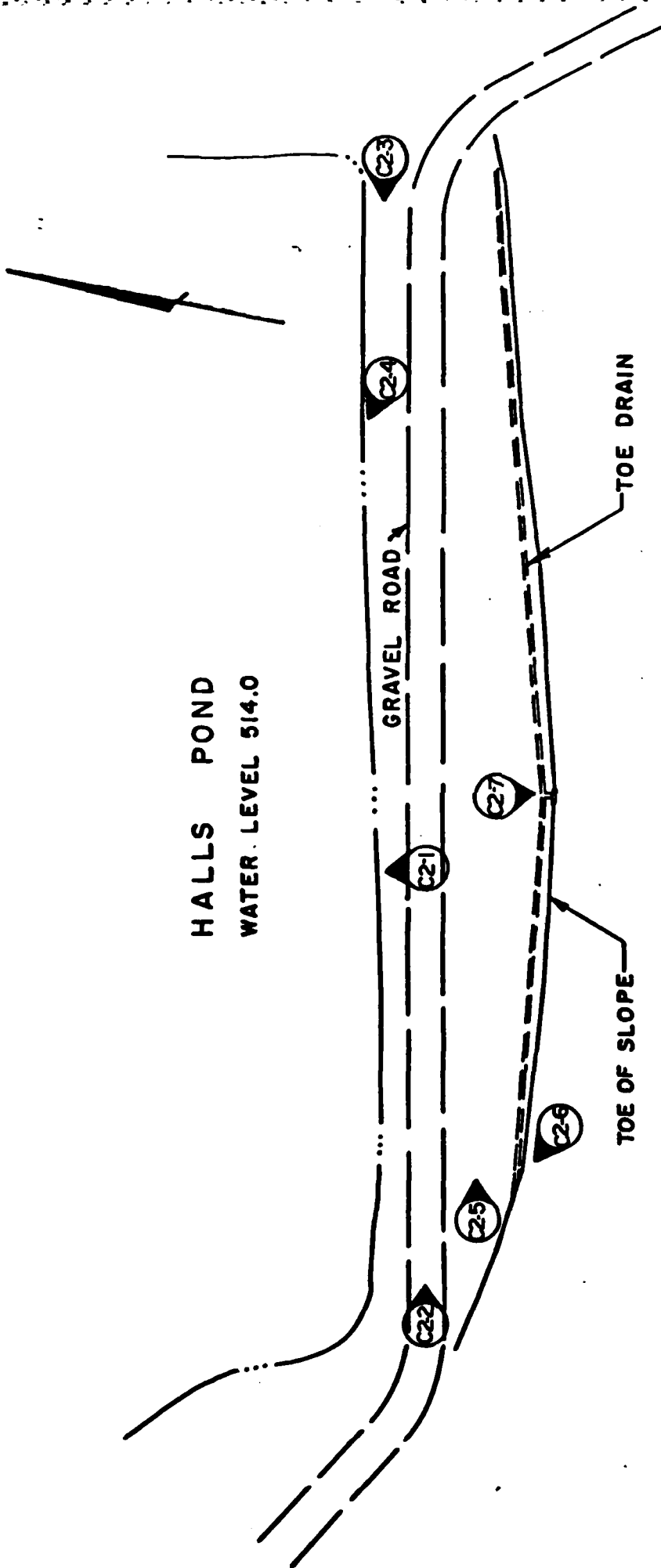
TOE OF SLOPE

HALLS POND
SOUTH DAM

PLAN

SCALE: 1" = 40'

PHOTO INDEX





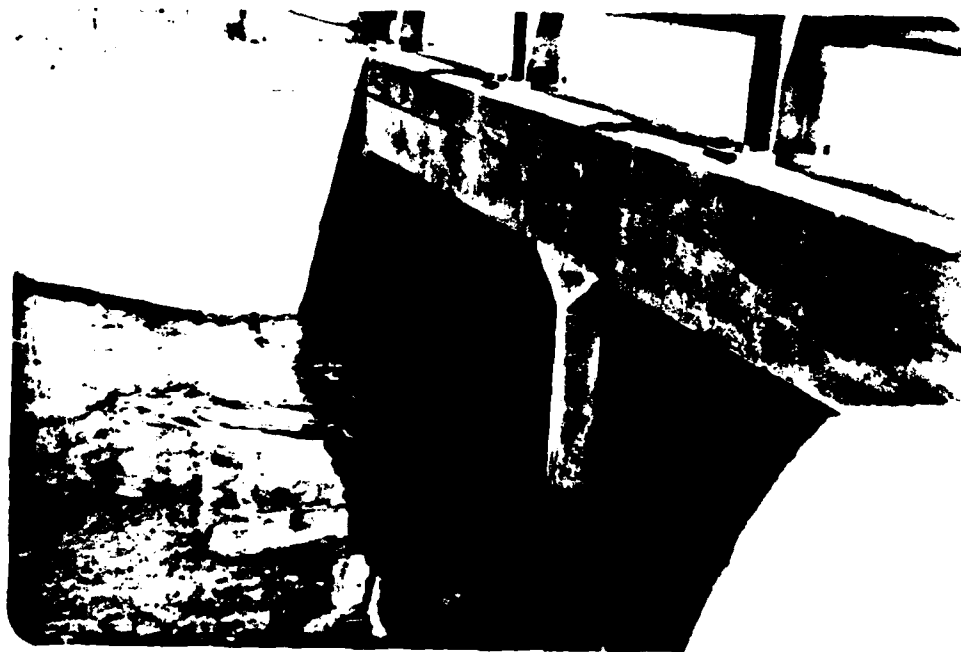
C1-1 UPSTREAM SLOPE



C1-2 DOWNSTREAM SLOPE



C1-3 DOWNSTREAM SLOPE AT SPILLWAY



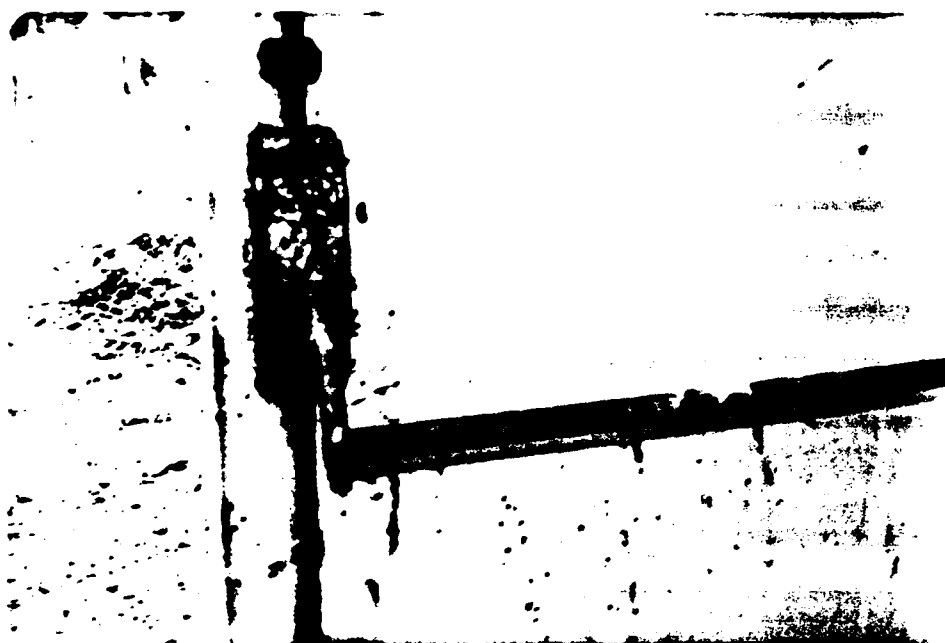
C1-4 UPSTREAM END OF SPILLWAY



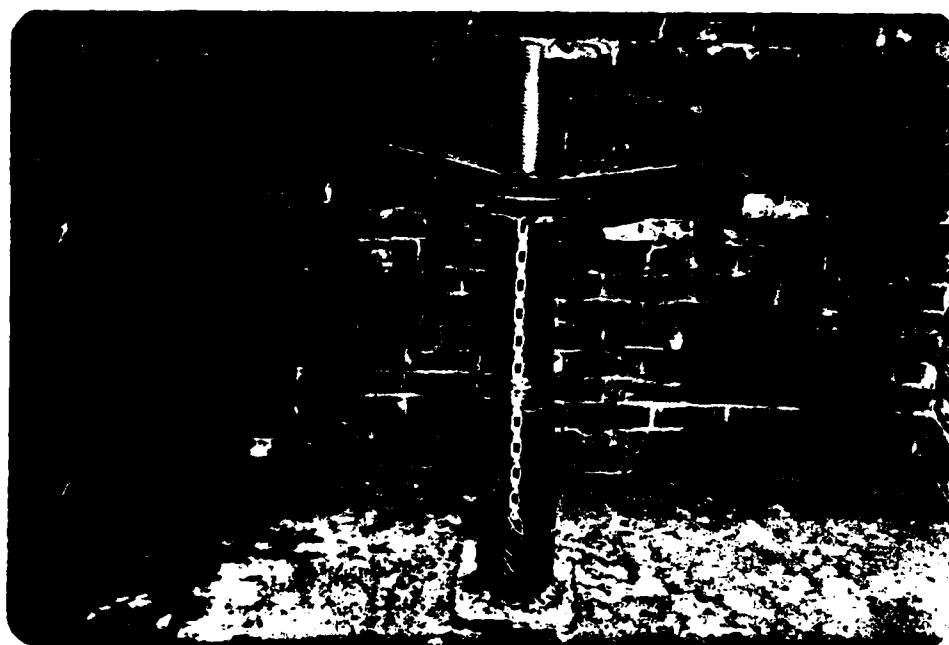
C1-5 DOWNSTREAM END OF SPILLWAY



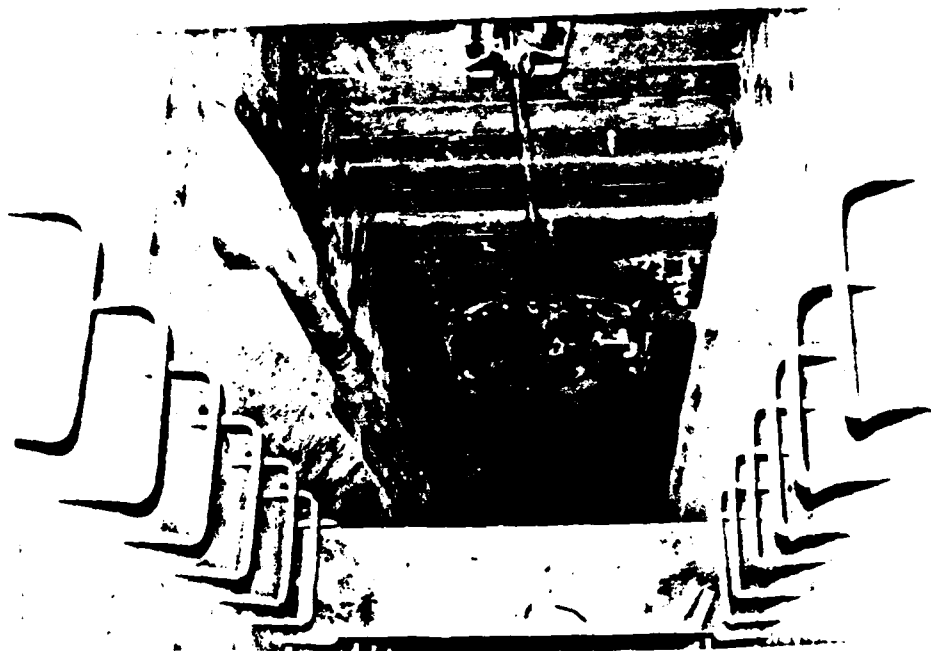
C1-6 GATEHOUSE



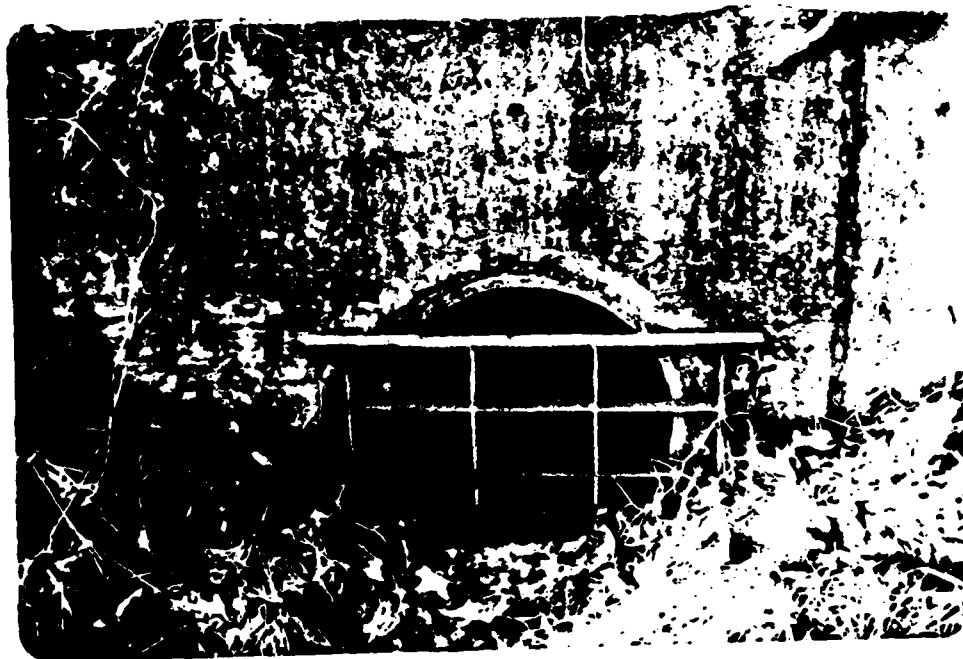
C1-7 GATEHOUSE DOOR LATCH



C1-8 GATE CONTROL WHEEL



C1-9 GATE PIT



C1-10 OUTLET CONDUIT



C1-11 DOWNSTREAM CHANNEL



C2-1 POND LOOKING NORTH



C2-2 DIKE CREST



C2-3 UPSTREAM FACE



C2-4 MISSING RIPRAP ON UPSTREAM FACE



C2-5 DOWNSTREAM FACE



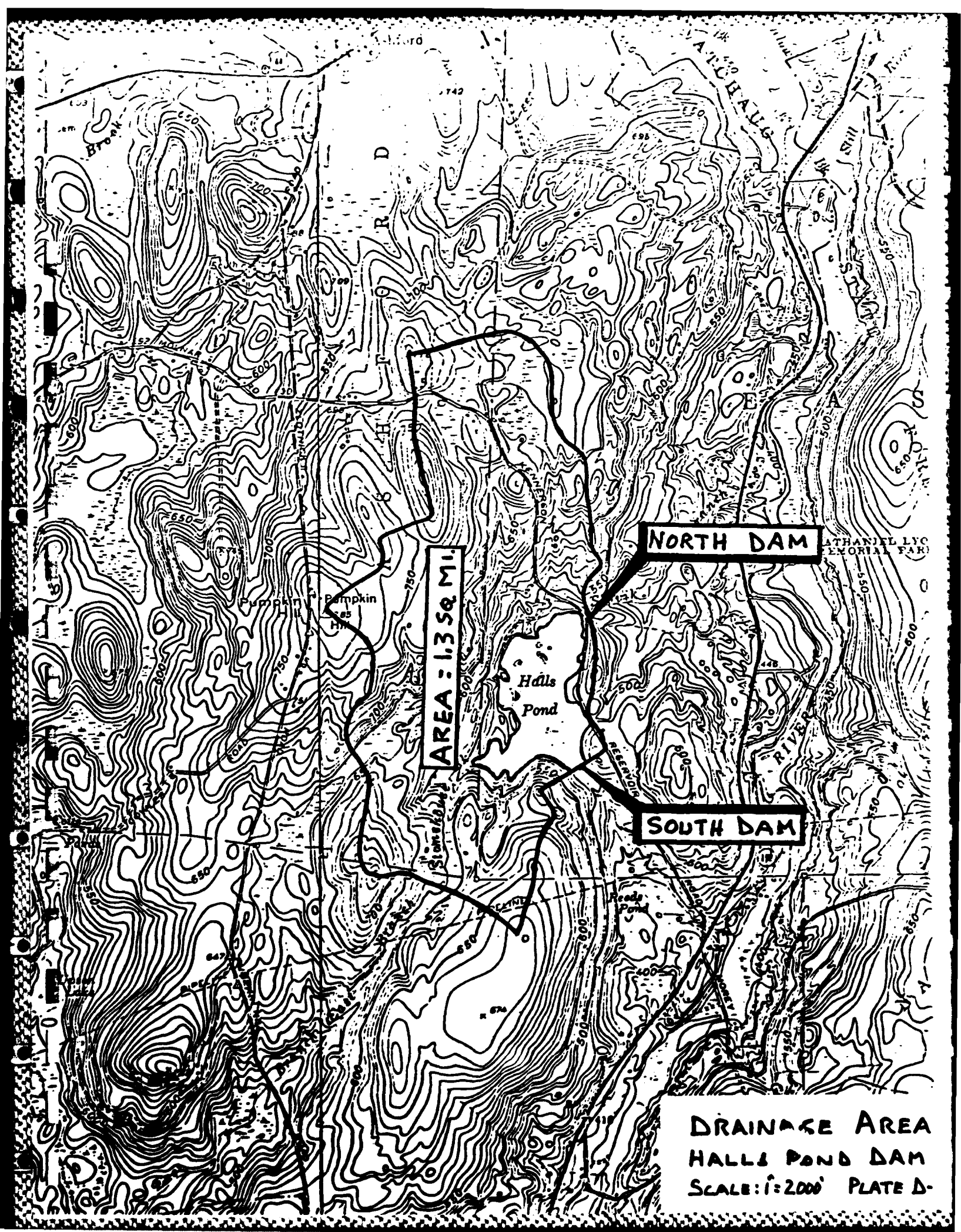
C2-6 SEEPAGE ON DOWNSTREAM FACE

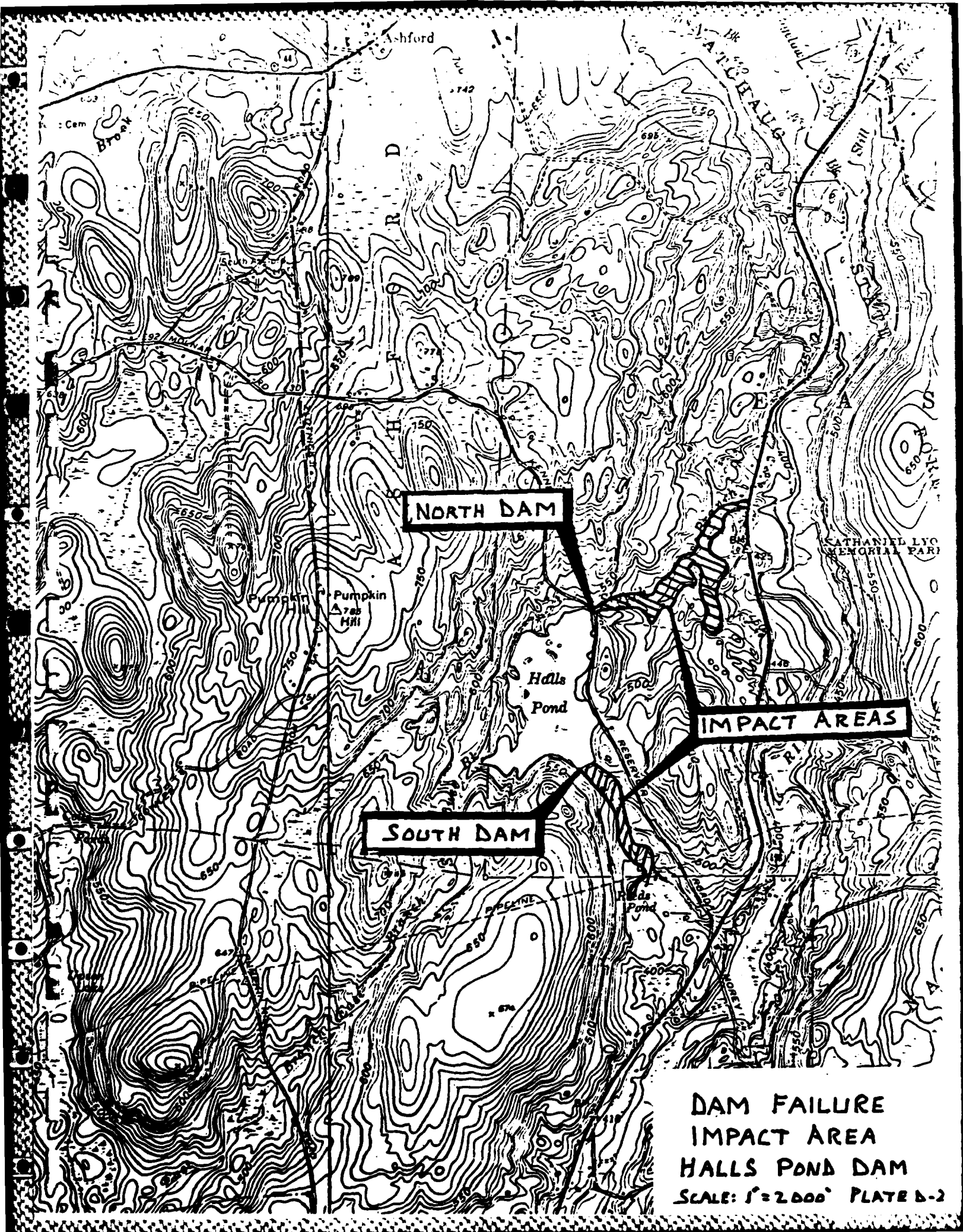


C2-7 DOWNSTREAM CHANNEL

APPENDIX D

HYDROLOGIC AND HYDRAULIC
COMPUTATIONS





NORTH DAM

SOUTH DAM

IMPACT AREAS

DAM FAILURE
IMPACT AREA
HALLS POND DAM
SCALE: 1"=2000' PLATE D-2



FUSS & O'NEILL
consulting engineers

PREPARED

BY

GJM

DATE

4/13/81

CHECKED

BY

DATE

PROJECT NO.

80-157

SUBJECT: Hydrologic & Hydraulic Computations - Halls Pond

SHEET NO.

1 of 14

Watershed Slope - Rolling

Storage Volume:

Surface Area at Spillway Elev. = 82.3 Ac
Ave. Depth = 6.7 Ft.
Volume = $82.3 \times 6.7 = 550$ Ac.-Ft.

Depth from Spillway to Top of Dam = 4.0'
Volume = $85 \times 4.5 = 340$ Ac.-Ft.

Total Storage = 890 Ac.-Ft.

Size Classification = Small

Use 100 yr. Frequency Storm For Test Flood

Following Information Developed For 1968
Reconstruction of Dam:

Drainage Area = 820 Ac
Time of Concentration = 85 Min
Runoff Coefficient = 0.34

From Conn. D.O.T. Drainage Manual

100 yr. Rainfall = 2.0"/hr

$$Q_{100} = 820 \times 0.34 \times 2.0 \\ = 560 \text{ cfs.}$$

Effect of Surcharge Storage

Un gated Spillway = Twin 9' Wide Box Culvert with
Height = 4.3' at Entrance

Use Inlet Control For Capacity with Invert = Elev. 514.

Gated Outlet = 24" RCP with "U" Endwall
Invert = 504.0 at Intake

Invert = 503.5 at Outlet from Gate Structure



FUSS & O'NEILL
consulting engineers

PREPARED
BY
GSM

DATE
4/13/81

CHECKED
BY

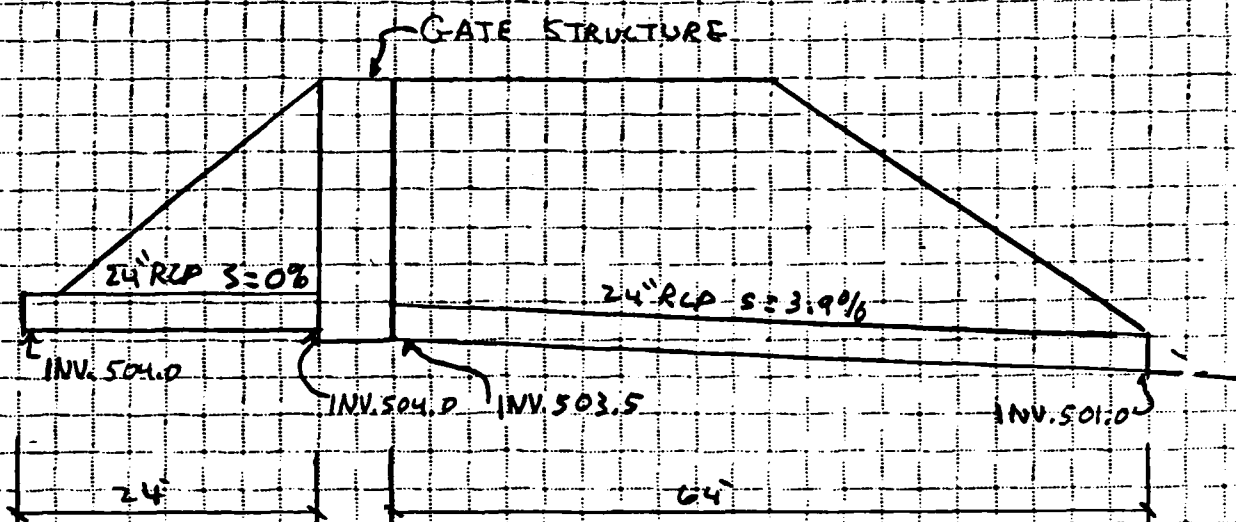
DATE

PROJECT N

80-157

SUBJECT: Hydrologic & Hydraulic Computations - Halls Pond

SHEET NO.
2 of 14



For Capacity Use Orifice Equation for Inlet from Lake with coefficient as developed in King & Brater's Handbook of Hydraulics Page 4-23. Use Inlet Control for outlet pipe from Gate Structure.

At Elev. 517.5, the south dike will be topped

at Elev. 518.0 the north dike will be topped

South Dike Length = 250' $C = 2.60$

$$Q = CLH^{3/2} = 250 \times 2.60 \times H^{3/2} = 650 H^{3/2}$$

North Dike Length = 250' $C = 2.40$ (Fence obstructions)

$$Q = 600 H^{3/2}$$



FUSS & O'NEILL
consulting engineers

PREPARED
BY
GJM

DATE
4/13/81

CHECKED
BY

DATE

PROJECT NO.

80-157

SUBJECT: Hydrologic & Hydraulic Computations - Halls Pond

SHEET NO.
3 of 14

Summary of Discharge Flows

| ELEV | Ungated Structure | Gated Structure | South Dike Overflow | North Dike Overflow | Total |
|-------|----------------------|--------------------|------------------------|------------------------|-------|
| 516.0 | 170 cfs | 40 | 0 | 0 | 210 |
| 517.0 | 280 | 40 | 0 | 0 | 320 |
| 518.0 | 430 | 40 | 230 | 0 | 700 |
| 518.5 | 500 | 50 | 650 | 210 | 1410 |
| 519.0 | 560 | 50 | 1190 | 600 | 2400 |

$$Q_{p1} = 560 \text{ cfs}$$

Surcharge Height to pass $Q_{p1} = 517.6$ (3.6')

$$\text{Volume of Surcharge} = \text{STOR}_1 = 85 \text{ Ac} \times 3.6 = 306.0 \text{ Ac. Ft}$$

$$\text{Drainage Area} = 1.3 \text{ Sq. Mi.} = 830 \text{ Ac}$$

$$306 \div 830 \times 12 = 4.4 \text{ in. Runoff}$$

$$100 \text{ Year Runoff} = 5.2'$$

$$Q_{p2} = 560 \left(1 - \frac{4.4}{5.2}\right) = 90 \text{ cfs}$$

Surcharge Height to pass $Q_{p2} = 514.9$ (0.9')

$$\text{Volume of Surcharge} = \text{STOR}_2 = 85 \times 0.9 = 76.5 \text{ Ac. Ft}$$

$$76.5 \div 830 \times 12 = 1.1 \text{ in. Runoff}$$

$$\text{Avg. STOR}_1 \text{ \& STOR}_2 = (306 + 76.5) \div 2 = 191 \text{ Ac. Ft}$$

Surcharge = 2.3' (Elev. 516.3)

$$Q_{p3} = 243 \text{ cfs}$$



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SHEET NO.
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STAGE - DISCHARGE

| <u>STATION</u> | <u>SLOPE</u> | <u>M</u> | <u>ELEVATION</u> | <u>AREA</u> | <u>Q</u> |
|----------------|--------------|----------|------------------|-------------|----------|
| 1+0 | 1.0% | .100 | 510 | 650 | 2,100 |
| | | | 515 | 1960 | 9,600 |
| | | | 520 | 3910 | 24,800 |
| 5+0 | 6.7% | .100 | 500 | 620 | 3,800 |
| | | | 505 | 2320 | 30,600 |
| 10+0 | 2.6% | .100 | 475 | 650 | 4,400 |
| | | | 480 | 1450 | 14,100 |
| 15+0 | 3.1% | .100 | 460 | 270 | 900 |
| | | | 465 | 1370 | 11,000 |
| 20+0 | 2.6% | .100 | 440 | 300 | 950 |
| | | | 445 | 1800 | 11,900 |
| 25+0 | 0.8% | .060 | 426 | 240 | 500 |
| | | | 430 | 2200 | 10,600 |



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SHEET NO.
5 of 14

$$\text{Storage} = S = 550 \text{ A.C.Ft}$$

$$\text{Top of Dam Elev.} = 517.5$$

$$\text{River bed Elev. at Sta. } 3+0 = 503.5 \quad \& \text{ Dam} = 0+0$$

$$\text{Dam Length at M.D. - Height} = 260'$$

$$260 \times .40 = 104' = \text{Breach width} = W_b$$

$$Y_0 = 14'$$

$$Q_{p1} = \frac{8}{27} W_b \sqrt{g} Y_0^{3/2}$$
$$= 9,200 \text{ cfs}$$

STA. 1+00

$$\text{Stage} = 514.7$$

$$\text{Area} = 1890 \text{ S.F.}$$

$$\text{Vol.} = 4 \text{ A.C.Ft}$$

$$Q_{p2} \text{ Trial} = 9200 \left(1 - \frac{4}{550}\right) = 9,100 \text{ cfs}$$

$$\text{Stage} = 514.7$$

$$\text{Area} = 1870 \text{ S.F.}$$

$$\text{Vol.} = 4 \text{ A.C.Ft}$$

$$Q_{p2} = 9,100 \text{ cfs}$$

$$\text{Stage} = 514.7$$

$$\text{Depth} = 11.2'$$



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SHEET NO
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STA. 5+0

$$Q_{p2} = 9,100 \text{ cfs}$$
$$\text{Stream bed Elev.} = 496$$
$$S = 550 - 42 = 546 \text{ Ac. Ft.}$$

$$\text{Stage} = 501.0$$
$$\text{Area} = 960 \text{ S.F.}$$
$$\text{Vol.} = 9 \text{ Ac. Ft.}$$

$$Q_{p3} \text{ Thiel} = 9,100 \left(1 - \frac{9}{546}\right) = 9,000 \text{ cfs}$$

$$\text{Stage} = 501.0$$
$$\text{Area} = 950$$
$$\text{Vol.} = 9 \text{ Ac. Ft.}$$

$$Q_{p3} = 9,000 \text{ cfs}$$

$$\text{Stage} = 501.0$$

$$\text{Depth} = 5.0'$$

STA. 10+0

$$Q_{p3} = 9,000 \text{ cfs}$$
$$\text{Stream bed Elev.} = 468$$
$$S = 546 - 9 = 537 \text{ Ac. Ft.}$$

$$\text{Stage} = 477.4$$
$$\text{Area} = 1030 \text{ S.F.}$$
$$\text{Vol.} = 12 \text{ Ac. Ft.}$$

$$Q_{p4} \text{ Thiel} = 9,000 \left(1 - \frac{12}{537}\right) = 8,800 \text{ cfs}$$

$$\text{Stage} = 477.3$$
$$\text{Area} = 1010 \text{ S.F.}$$
$$\text{Vol.} = 12 \text{ Ac. Ft.}$$

$$Q_{p4} = 8,800 \text{ cfs}$$

$$\text{Stage} = 477.3$$

$$\text{Depth} = 9.3'$$



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SHEET NO
7 of 11

STA. 15+0

$$Q_{p4} = 8800 \text{ cfs}$$
$$\text{Streambed Elev.} = 457$$
$$S = 537 - 12 = 525 \text{ Ac. Ft.}$$

$$\text{Stage} = 463.9$$
$$\text{Area} = 1130 \text{ S.F.}$$
$$\text{Vol.} = 13 \text{ Ac. Ft.}$$

$$Q_{p5} \text{ Trial} = 8800 \left(1 - \frac{13}{525}\right) = 8600 \text{ cfs}$$

$$\text{Stage} = 463.8$$
$$\text{Area} = 1110 \text{ S.F.}$$
$$\text{Vol.} = 13 \text{ Ac.}$$

$$Q_{p5} = 8,600 \text{ cfs}$$

$$\text{Stage} = 463.8$$

$$\text{Depth} = 6.8'$$

STA. 20+0

$$Q_{p5} = 8,600 \text{ cfs}$$
$$\text{Streambed Elev.} = 437$$
$$S = 525 - 13 = 512 \text{ Ac. Ft.}$$

$$\text{Stage} = 443.5$$
$$\text{Area} = 1350 \text{ S.F.}$$
$$\text{Vol.} = 15 \text{ Ac. Ft.}$$

$$Q_{p6} \text{ Trial} = 8600 \left(1 - \frac{15}{512}\right) = 8300 \text{ cfs}$$

$$\text{Stage} = 443.4$$
$$\text{Area} = 1310 \text{ S.F.}$$
$$\text{Vol.} = 15 \text{ Ac. Ft.}$$

$$Q_{p6} = 8,300 \text{ cfs}$$

$$\text{Stage} = 443.4'$$

$$\text{Depth} = 6.4'$$



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STA. 25+0

$$Q_{p6} = 8,300 \text{ cfs}$$

Stream bed Elev. = 425

$$S = 512 - 15 = 497 \text{ Ac. Ft.}$$

$$\text{Stage} = 429.1$$

$$\text{Area} = 1750 \text{ S.F.}$$

$$\text{Vol.} = 20 \text{ Ac. Ft.}$$

$$Q_{p7} \text{ Trial} = 8300 \left(1 - \frac{20}{497}\right) = 8000 \text{ cfs}$$

$$\text{Stage} = 429.0$$

$$\text{Area} = 1700 \text{ S.F.}$$

$$\text{Vol.} = 20 \text{ Ac. Ft.}$$

$$Q_{p7} = 8000 \text{ cfs}$$

$$\text{Stage} = 429.0$$

$$\text{Depth} = 4.0' < 5'$$



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SHEET NO.
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STAGE - DISCHARGE

| STATION | SLOPE | n | ELEVATION | AREA | Q |
|---------|--------|------|-----------|------|--------|
| 0+70 | 1.375% | .100 | 505 | 1930 | 12,000 |
| | | | 510 | 3510 | 28,700 |
| 5+0 | 5.0% | .100 | 485 | 450 | 3,400 |
| | | | 490 | 1260 | 14,400 |
| 10+0 | 2.6% | .100 | 465 | 1750 | 12,400 |
| | | | 470 | 3880 | 36,800 |
| 15+0 | 0.66% | .100 | 455 | 1200 | 3,900 |
| | | | 460 | 2880 | 13,100 |
| | | | 465 | 5130 | 29,600 |
| 20+0 | 0.66% | .100 | 450 | 560 | 1,200 |
| | | | 455 | 1920 | 7,700 |
| | | | 460 | 3720 | 20,100 |
| 25+0 | 0.66% | .100 | 450 | 670 | 2,200 |
| | | | 455 | 1520 | 7,400 |
| | | | 460 | 2540 | 15,600 |
| 30+0 | 2.0% | .100 | 440 | 350 | 1,700 |
| | | | 445 | 1100 | 7,300 |
| | | | 450 | 2350 | 19,700 |
| 35+0 | 6.7% | .080 | 420 | 450 | 5,900 |
| | | | 425 | 1100 | 19,300 |
| 37+0 | 2.6% | .040 | 410 | 120 | 800 |
| | | | 415 | 860 | 13,800 |



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SHEET NO.
10 of 14

$$\text{Storage} = S = 550 \text{ Ac. Ft.}$$

$$\text{Top of Dam Elev.} = 518.0$$

$$\text{River bed Elev. at Sta. } 0+70 (\& \text{ Dam} = 0+0) = 494.5$$

$$\text{Dam Length at Mid-Height} = 185'$$

$$185 \times .40 = 74' = \text{Breach Width} = W_b$$

$$Y_0 = 23.5'$$

$$Q_{p1} = 8/23 W_b \sqrt{g} Y_0^{3/2}$$
$$= 14,200 \text{ cfs}$$

STA. 0+70

$$\text{Stage} = 505.7$$

$$\text{Area} = 2140 \text{ S.F.}$$

$$\text{Vol.} = 3 \text{ Ac. Ft.}$$

$$Q_{p2} \text{ Trial} = 14,200 \left(1 - \frac{3}{550}\right) = 14,100 \text{ cfs}$$

$$\text{Stage} = 505.6$$

$$\text{Area} = 2130 \text{ S.F.}$$

$$\text{Vol.} = 3 \text{ Ac. Ft.}$$

$$Q_{p2} = 14,200 \left(1 - \frac{3}{550}\right) = 14,100 \text{ cfs}$$

$$\text{Stage} = 505.6$$

$$\text{Depth} = 11.1'$$



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PROJECT

80-15

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SHEET N
11 of 1

STA. 5+0

$Q_{p2} = 14,100$ cfs
Stream bed Elev. = 480
 $S = 550 - 3 = 547$ Ac. Ft.

Stage = 489.9
Area = 1240 S.F.
Vol. = 12 Ac. Ft.

$Q_{p3} \text{ Trial} = 14,100 \left(1 - \frac{12}{547}\right) = 13,800$ cfs

Stage = 489.7
Area = 1220 S.F.
Vol. = 13 Ac. Ft.

$Q_{p3} = 14,100 \left(1 - \frac{12}{547}\right) = 13,800$

Stage = 489.7

Depth = 9.7'

STA. 10+0

$Q_{p3} = 13,800$ cfs
Stream bed Elev. = 456
 $S = 547 - 13 = 534$ Ac. Ft.

Stage = 465.3
Area = 1870 S.F.
Vol. = 21 Ac. Ft.

$Q_{p4} \text{ Trial} = 13,800 \left(1 - \frac{21}{534}\right) = 13,300$ cfs

Stage = 465.2
Area = 1830 S.F.
Vol. = 21 Ac. Ft.

$Q_{p4} = 13,300$ cfs

Stage = 465.2

Depth = 9.2'



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SHEET NO
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STA. 15+0

$$Q_{p4} = 13,300 \text{ cfs}$$
$$\text{Stream bed Elev} = 448$$
$$S = 539 - 21 = 513 \text{ A.C.Ft.}$$

$$\text{Stage} = 460.1$$
$$\text{Area} = 2910$$
$$\text{Vol} = 33 \text{ A.C.Ft.}$$

$$Q_{p5} \text{ Trial} = 13,300 \left(1 - \frac{33}{513}\right) = 12,400 \text{ cfs}$$

$$\text{Stage} = 459.6$$
$$\text{Area} = 2750 \text{ S.F.}$$
$$\text{Vol} = 32 \text{ A.C.Ft.}$$

$$Q_{p5} = 13,300 \left(1 - \frac{33}{513}\right) = 12,400 \text{ cfs}$$

$$\text{Stage} = 459.6$$

$$\text{Depth} = 11.6'$$

STA. 20+0

$$Q_{p5} = 12,400 \text{ cfs}$$
$$\text{Stream bed Elev} = 445$$
$$S = 513 - 33 = 480 \text{ A.C.Ft.}$$

$$\text{Stage} = 456.9$$
$$\text{Area} = 2600 \text{ S.F.}$$
$$\text{Vol} = 30 \text{ A.C.Ft.}$$

$$Q_{p6} \text{ Trial} = 12,400 \left(1 - \frac{30}{480}\right) = 11,600 \text{ cfs}$$

$$\text{Stage} = 456.6$$
$$\text{Area} = 2490 \text{ S.F.}$$
$$\text{Vol} = 29 \text{ A.C.Ft.}$$

$$Q_{p6} = 11,600 \text{ cfs}$$

$$\text{Stage} = 456.6$$

$$\text{Depth} = 11.6'$$



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PROJECT 1

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SHEET NO
13 of 14

STA. 25+0

$$Q_{p6} = 11,600 \text{ cfs}$$
$$\text{Stream bed Elev.} = 441$$
$$S = 480 - 30 = 450$$

$$\text{Stage} = 457.6$$
$$\text{Area} = 2050 \text{ S.F.}$$
$$\text{Vol.} = 24 \text{ Ac. Ft.}$$

$$Q_{p7} \text{ Trial} = 11,600 \left(1 - \frac{24}{450}\right) = 11,000 \text{ cfs}$$

$$\text{Stage} = 457.2$$
$$\text{Area} = 1980 \text{ S.F.}$$
$$\text{Vol.} = 23 \text{ Ac. Ft.}$$

$$Q_{p7} = 11,000 \text{ cfs}$$

$$\text{Stage} = 457.2$$

$$\text{Depth} = 16.2'$$

STA. 30+0

$$Q_{p7} = 11,000 \text{ cfs}$$
$$\text{Stream bed Elev.} = 433$$
$$S = 450 - 24 = 426 \text{ Ac. Ft.}$$

$$\text{Stage} = 446.5$$
$$\text{Area} = 1470 \text{ S.F.}$$
$$\text{Vol.} = 17 \text{ Ac. Ft.}$$

$$Q_{p8} \text{ Trial} = 11,000 \left(1 - \frac{17}{426}\right) = 10,600 \text{ cfs}$$

$$\text{Stage} = 446.3$$
$$\text{Area} = 1430 \text{ S.F.}$$
$$\text{Vol.} = 16 \text{ Ac.}$$

$$Q_{p8} = 10,600 \text{ cfs}$$

$$\text{Stage} = 446.3$$

$$\text{Depth} = 13.3'$$



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PROJECT

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SHEET NO
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STA. 35+0

$$Q_{pg} = 10,600 \text{ cfs}$$
$$\text{Stream bed Elev.} = 411$$
$$S = 426.17 = 409 \text{ AC.Ft.}$$

$$\text{Stage} = 421.8$$
$$\text{Area} = 680 \text{ S.F.}$$
$$\text{Vol.} = 8 \text{ AC.Ft.}$$

$$Q_{pg} \text{ Trial} = 10,600 \left(1 - \frac{8}{409}\right) = 10,400 \text{ cfs}$$

$$\text{Stage} = 421.7$$
$$\text{Area} = 670 \text{ S.F.}$$
$$\text{Vol.} = 8 \text{ AC.Ft.}$$

$$Q_{pg} = 10,400 \text{ cfs}$$

$$\text{Stage} = 421.7$$

$$\text{Depth} = 10.7'$$

STA. 37+0

$$Q_{pg} = 10,400 \text{ cfs}$$
$$\text{Stream bed Elev.} = 405$$
$$S = 409.8 = 401 \text{ AC.Ft.}$$

$$\text{Stage} = 413.7$$
$$\text{Area} = 670 \text{ S.F.}$$
$$\text{Vol.} = 3 \text{ AC.Ft.}$$

$$Q_{pg} \text{ Trial} = 10,400 \left(1 - \frac{3}{401}\right) = 10,300 \text{ cfs}$$

$$\text{Stage} = 413.6$$
$$\text{Area} = 660 \text{ S.F.}$$
$$\text{Vol.} = 3 \text{ AC.Ft.}$$

$$Q_{pg} = 10,300 \text{ cfs}$$

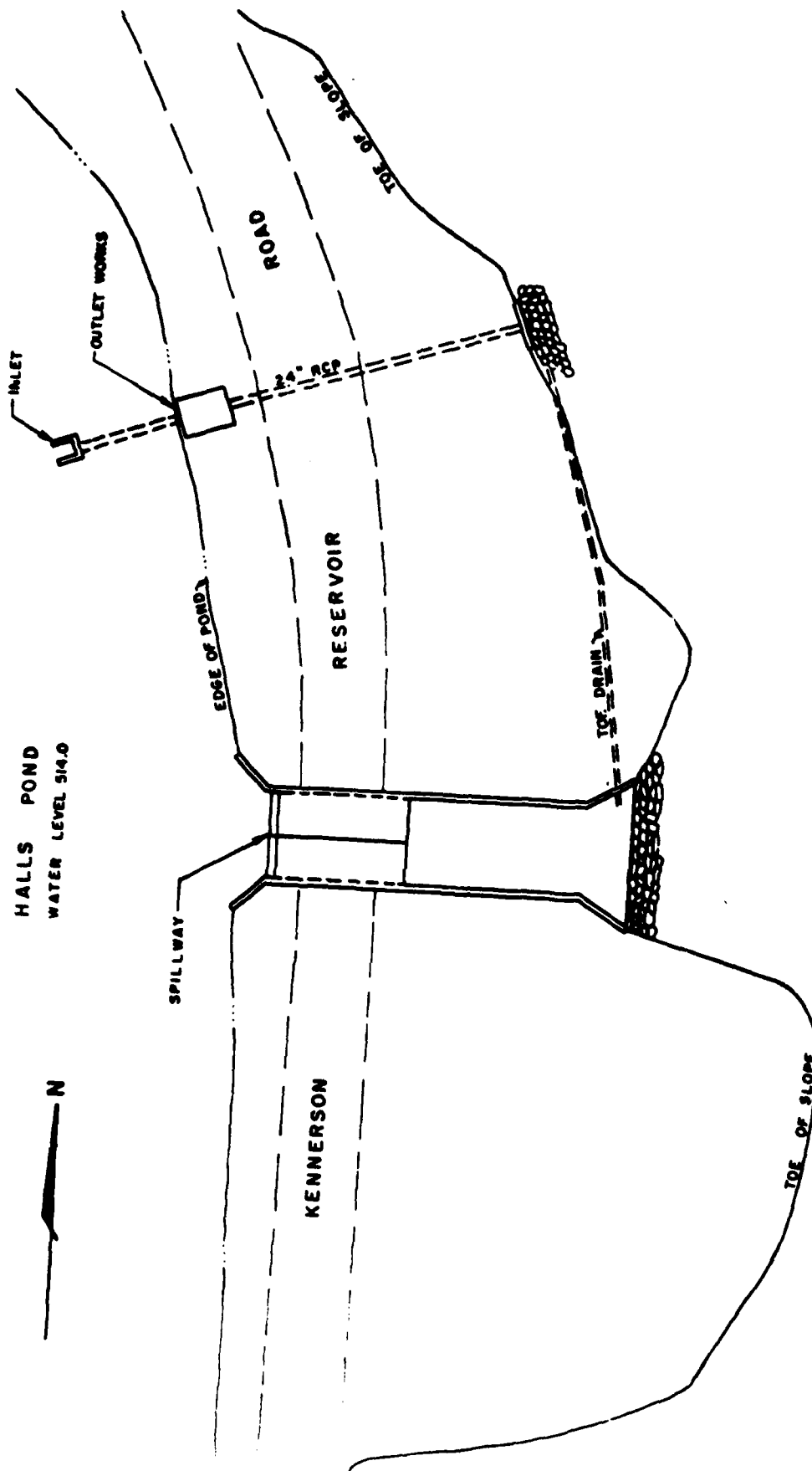
$$\text{Stage} = 413.6$$

$$\text{Depth} = 8.6'$$

Slovak Brook joins Natchaug River and disappears

HALLS POND
WATER LEVEL 514.0

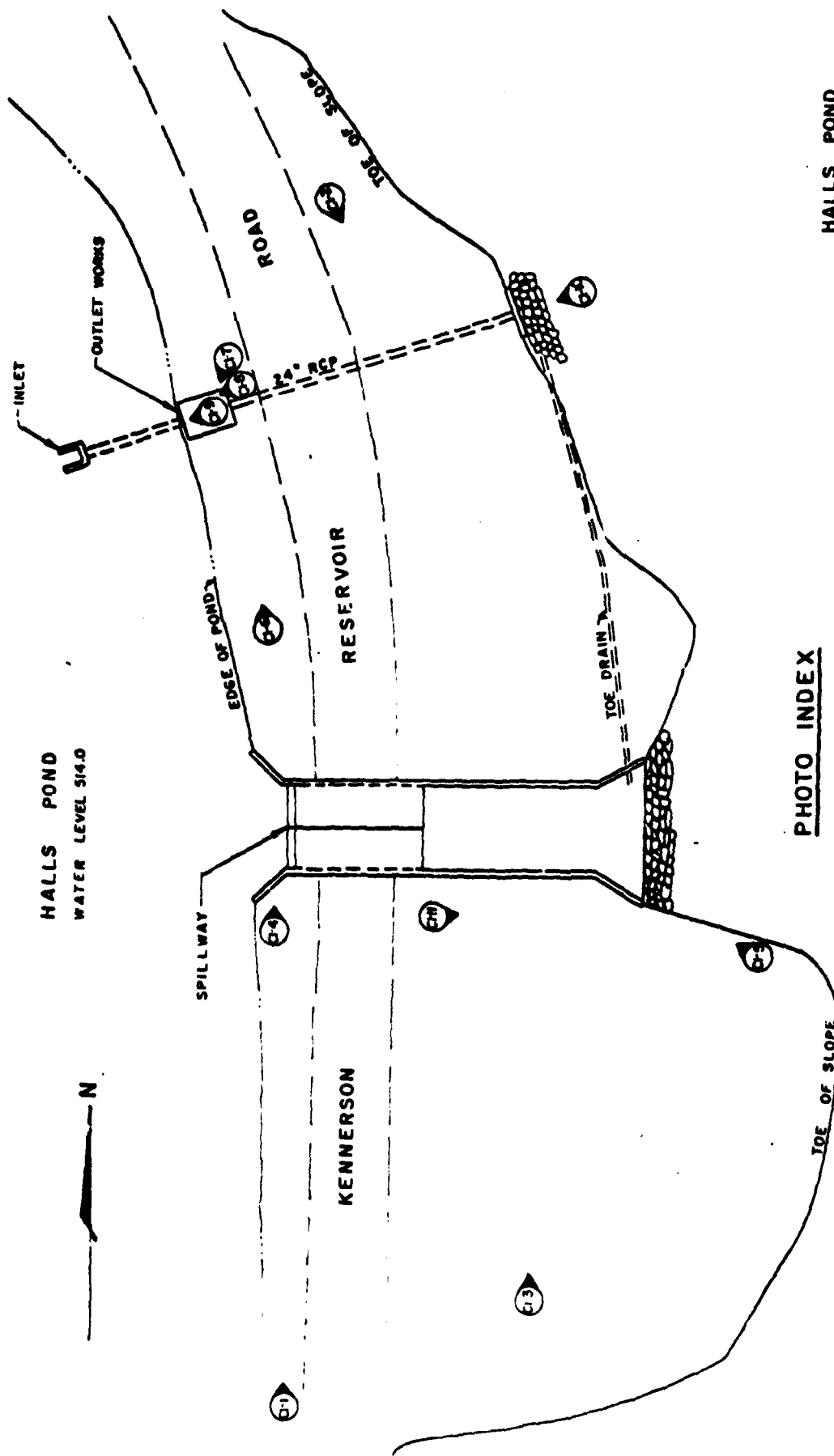
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HALLS POND
NORTH DAM

PLAN

SCALE 1"=20' PLATE B-1



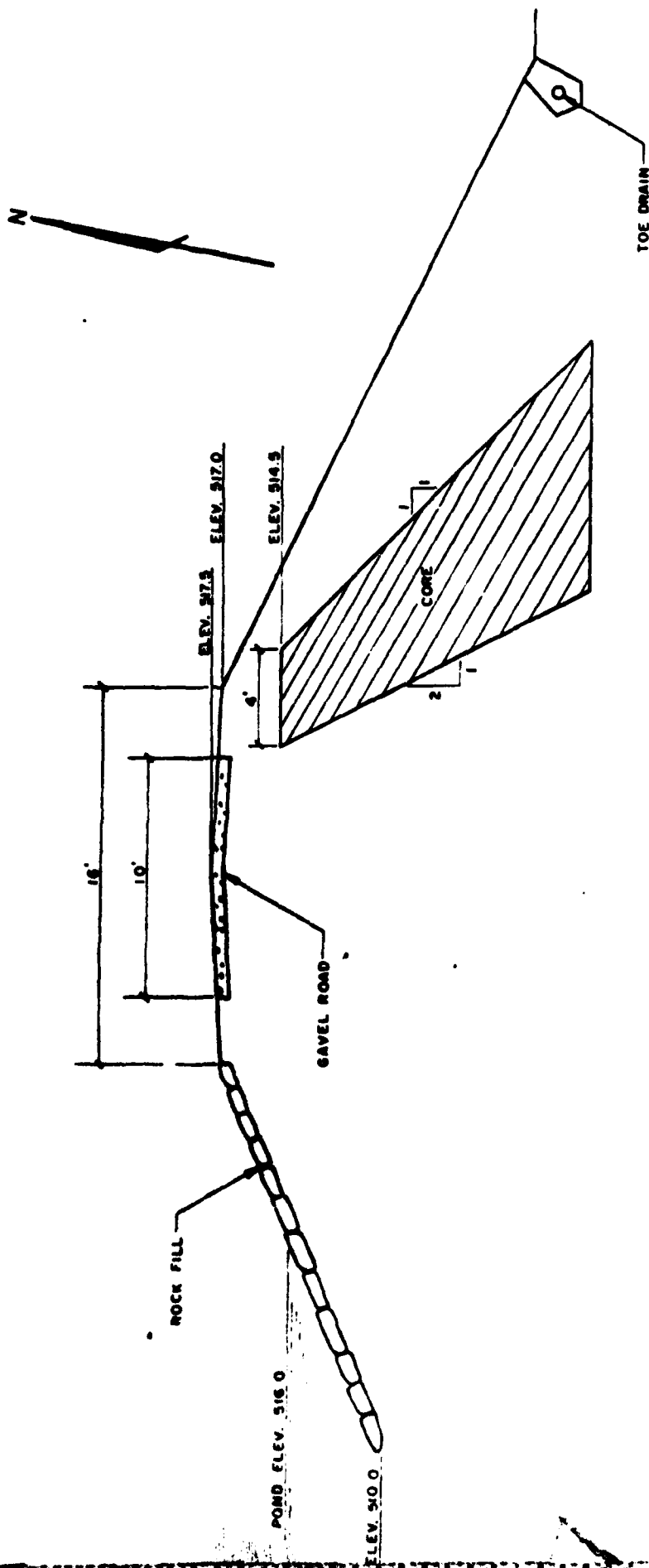
HALLS POND
WATER LEVEL 514.0

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PHOTO INDEX

HALLS POND
NORTH DAM
PLAN

SCALE 1"=20'



HALLS POND
SOUTH DAM
TYPICAL SECTION
SCALE 1/4"=1'-0" PLATE B-5

END

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